many different stages irregularities in chromosome distribution may occur in a variety of ways. GATES believes several characters of *O. gigas* cited by DE VRIES as occurring independently of chromosome doubling are the result of the tetraploid condition with its larger cells and nuclei. Many such differences are attributed to causes fundamentally quantitative. The interpretation of NILSSON, that *O. gigas* originates by the accumulation of factors for size, is held by GATES to be contradicted by the cytological facts and by the sudden origin of giant types with their subsequent wide variation. Although some *Oenothera* characters are Mendelian in their behavior after they appear, Mendelian combinations in NILSSON's sense are inadequate to account for their first appearance.—L. W. SHARP.

A heterosporous fern.—LIGNIER[24] has published a new genus (*Mittagia*) from the Lower Westphalian strata, which is the first heterosporous fossil fern to be described. That such a group did occur is, of course, postulated by the existence of the seed ferns, but this is the first demonstration of its presence. LIGNIER, too, has sounded a note of warning by his discovery. He was at first inclined to consider that his sections were of a pteridosperm, *Lagenostoma Lomaxi*, so similar in structure are the outer tissues of the sporangia in the two forms. When he found four megaspores to a sporangium, a stomium present, and the sporangia arranged in a sorus, he knew that he had something different. His sporangium, however, he considers did not dehisce, and so, like *Lepidocarpon*, is a stage toward the seed habit. His conclusion that the sporangia belonged to a fern is based chiefly on their structural resemblance to *Lagenostoma*, and on their arrangement in a sorus. He has further distinguished them from the lycopod and equisetum lines, from *Lepidocarpon*, *Miadesmia*, *Selaginella*, heterosporous calamites, etc. LIGNIER'S intensive study of the small amount of material at his disposal and his logical deductions are exceedingly interesting and valuable.—R. B. THOMSON.

Evaporation in Skokie Marsh.—Using the Livingston atmometer, SHERFF[25] measured the evaporating power of the air in a marsh habitat near the city of Chicago during the summer of 1911. The average daily rate of evaporation for the lowest stratum of vegetation was 3 cc. for the *Typha* association, 4.27 cc. for the reed swamp, 4.5 cc. for the swamp meadow, and 7.9 cc. for the swamp forest of *Quercus bicolor* and *Fraxinus americana*. This forest is normally antecedent to a truly mesophytic forest such as that found by the reviewer to have an average daily rate of 8.1 cc.[26] During September and October of the

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[24] LIGNIER, O., Un noveau sporange séminiforme. Mém. Soc. Linn. Normandie **24**:49–65. 1913.

[25] SHERFF, E. E., Evaporation conditions at Skokie Marsh. Plant World **16**:154–160. 1912.

[26] BOT. GAZ. **52**:193–208. 1911.

same season SHERFF also obtained data upon the evaporation rates in different strata of the marsh vegetation, showing the evaporating power of the air to be 300 per cent greater in the top stratum of the *Phragmites* association than in the lowest, while the difference became three times as great in the *Typha* association. These results confirm those of YAPP[27] for a sedge vegetation and those of the reviewer[28] for the beech-maple forests, warranting the conclusion that plants may grow in proximity with each other and yet, vegetating in different horizontal strata, be subject to widely different growth conditions.—GEO. D. FULLER.

History and origin of monocotyledons.—HORWOOD[29] has done useful service in bringing together, in convenient form, the evidence of fossil monocotyledons. The record of each family is recited, and the summary shows that the first authentic specimens are from the Cretaceous, and that in the Tertiary or Post-Tertiary 24 families out of about 30 are represented. In dealing with the origin of monocotyledons, HORWOOD gives a synopsis of most of the views that have been advanced and reaches the following general conclusion: that the monocotyledons and dicotyledons are divergent series from a common ancestor; that among the dicotyledons there has been "progression and differentiation," while among the monocotyledons there has been "retrogression and even some reduction from a common ancestor of the primitive angiospermic type." This primitive type, by the way, "resembled an alismaceous or liliaceous type, on the one hand, and a ranalian type on the other," and in the background of this primitive stock the author sees the Cycadafilicales and Bennettitales. The mass of facts brought together will be very useful, even if the conclusions are not convincing.—J. M. C.

Fourth International Botanical Congress.—The first circular of the International Botanical Congress of 1915 has been issued. The sessions will be held in London from May 22 to May 29. Membership is secured by subscribing to the regulations of the congress and by the payment of a subscription of 15 shillings. Ladies accompanying members may attend the meetings and excursions of the congress on payment of 10 shillings each. The presidents of the organizing committee are Professor F. O. BOWER, Sir DAVID PRAIN, and Professor A. C. SEWARD. The general secretary is Dr. A. B. RENDLE, British Museum, Cromwell Road, London, S.W., to whom applications may be made.

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[27] YAPP, R. H., On stratification in the vegetation of a marsh, and its relations to evaporation and temperature. Ann. Botany **23**:275–320. 1909.

[28] BOT. GAZ. **54**:424–426. 1912.

[29] HORWOOD, A. R., The past history of monocotyledons, with remarks on their origin. Scottish Bot. Review **1**:164–180, 216–234. *pls. 1–4.* 1912.